

ATO ATO 20 hp (15 kW) AC Motor Soft Starter (220V RS485 Communication)

ATO 20 hp (15 kW) AC Motor Soft Starter (220V RS485 Communication) User Manual

MODEL: ATO 20 HP (15 kW) AC MOTOR SOFT STARTER (220V RS485 COMMUNICATION)

Brand: ATO

1. INTRODUCTION

The ATO AC Motor Soft Starter is an advanced electrical motor control device designed for three-phase AC motors. It integrates soft start, soft stop, energy-saving features, and multi-function protection. This device effectively reduces the inrush current surge typically caused by large loads during motor startup, thereby protecting equipment and extending its service life.

This soft starter is suitable for motors with a capacity of 20 hp (15 kW) and operates on a three-phase 220V AC supply with RS485 Communication capabilities. It provides essential protective functions including input open phase protection, output open phase protection, and running overload protection.

Why Choose a Soft Starter?

Direct starting of large motors can lead to significant inrush currents (4-7 times the rated current), which can negatively impact the power grid and other connected loads. Soft starters mitigate this by gradually increasing the voltage during startup, reducing mechanical stress on the motor and connected machinery, and preventing voltage sags in the power supply. This results in smoother operation and enhanced equipment longevity.

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Video: Explaining the difference between VFD, soft starter, and direct motor start.

2. SETUP AND WIRING

Proper wiring is crucial for the safe and effective operation of your ATO soft starter. Always ensure power is disconnected before performing any wiring. The soft starter requires a bypass contactor for optimal

performance and protection.

Product Overview



Image: Front view of the ATO AC Motor Soft Starter, showing the control panel and general layout.



Image: Bottom view of the soft starter, highlighting the motor output terminals (U, V, W) and control terminals.



Image: Top view of the soft starter, showing the power input terminals (R, S, T).

Wiring Instructions for Bypass Contactor

The ATO soft starter is designed to be used with a bypass contactor. The bypass contactor should have a rated current slightly exceeding that of the soft starter. Follow these steps for proper connection:

1. Connect the three-phase power supply (R, S, T) to the soft start input terminals.
2. Connect the soft start output terminals (U, V, W) to the motor input.
3. Connect the input contacts of the bypass contactor (L1, L2, L3) to the main power supply lines.
4. Connect the output terminals of the bypass contactor (U, V, W) in parallel to the soft start output terminals (U, V, W) that lead to the motor.
5. Connect the contactor coil contact A1 to phase line T (for 220V AC contactor coil).
6. Connect the contactor coil contact A2 (N2) to the soft start 'By-pass output' port 2.
7. Connect the 'By-pass output' port 1 to the power neutral line N1.
8. Connect the emergency stop button and the stop button to control ports 7, 8, and 10 (common).

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Video: Detailed guide on how to connect a bypass contactor to the soft starter.

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3. OPERATING INSTRUCTIONS

Basic Operation

In the normal working state, the soft starter will display 'READY STATE'.

- **Start:** Press the 'RUN' button to initiate the soft start sequence. The motor will accelerate to normal speed, and the bypass contactor will engage.
- **Stop:** Press the 'STOP/RESET' button to stop the motor. The soft starter will perform a soft stop, and the bypass contactor will disengage.
- **Display Information:** From the 'READY STATE', press 'YES' to cycle through displays of current voltage, soft starter specifications, and alarm records.

Parameter Setting

To adjust operational parameters:

1. From 'READY STATE', press the 'SET' key to enter the parameter setting interface.
2. Use the arrow keys (Up/Down) to navigate through different parameters (e.g., Motor Current, Bypass Time, Stop Limit).
3. Press 'YES' to confirm changes to a parameter.
4. Press 'SET' again to adjust the next parameter or 'STOP/RESET' to exit without saving.

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Video: Guide on ATO soft starter parameter setting and fault output.

Adjusting Rated Current

To change the rated current of the soft starter:

1. Enter the parameter setting interface by pressing 'SET'.
2. Navigate to the motor current parameter (e.g., 'FP: 23A MOTOR CURRENT').
3. Use the arrow keys to adjust the current value.
4. Press 'YES' to save the new setting.

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Video: Instructions on how to change the ATO motor soft starter rated current.

On-Delay Soft Start with Programmable Relay Output

The soft starter supports programmable relay output for advanced control, such as on-delay soft start. This allows for a timed delay before the motor fully engages or other actions are triggered.

- Access parameter 'FE' (Programmable Sequence Output Mode Selection).
- Select the appropriate numerical value for 'FE' based on your desired output timing (e.g., '2(12)' for output at the start of bypass operation).
- Set the desired delay time in parameter 'F4' (Program Delay). For example, setting F4 to '3s' will close the normally open contacts of terminals 3 and 4 after 3 seconds.

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4. MAINTENANCE

To ensure the longevity and reliable operation of your ATO soft starter, regular maintenance is recommended:

- Keep the unit clean and free from dust and debris.
- Periodically check all wiring connections to ensure they are secure.
- Inspect the bypass contactor for any signs of wear or damage.
- Ensure adequate ventilation around the soft starter to prevent overheating.

5. TROUBLESHOOTING

The soft starter is equipped with diagnostic features to help identify and resolve issues. The LCD display will show error codes when a fault occurs.

Common Error Scenarios:

- **Emergency Stop Button Activated:** If the emergency stop button is pressed, the LCD may display errors such as 'Error 01 7-10 OPEN', indicating an open circuit status. In this state, the soft starter cannot be run. Restore the emergency stop button to its normal position to resume operation.
- **Stop Button Pressed (External Control):** If the stop button is pressed, the LCD should display no abnormalities. However, if the RUN button is pressed while the stop button is engaged, the LCD may display 'Error 16 8-10 OPEN', and the RUN key will be inoperable. Resetting the stop button will restore normal operation.
- **Fault Output Port:** When no alarm error is present, the fault output port (terminals 5, 6) is open. If a fault occurs (e.g., terminals 7 and 10 are disconnected), a fault code is displayed, and the fault output port (5, 6) will close. After pressing the reset button, the fault output port returns to an open circuit.

For any persistent issues or error codes not listed, please refer to the full product manual or contact ATO customer support.

6. SPECIFICATIONS

Feature	Specification
Power Capacity	20 hp (15 kW)
Input Voltage	Three Phase 220V AC $\pm 15\%$
Input Frequency	50Hz / 60Hz
Current (at 220V)	60 Amps

Feature	Specification
Communication	RS485 Communication
Protective Functions	Input open phase, Output open phase, Running overload, etc.
Manufacturer	ATO

7. WARRANTY AND SUPPORT

ATO is committed to providing quality products and customer satisfaction. While specific warranty details are not provided in this document, please contact ATO customer support for any questions, issues, or technical assistance regarding your soft starter.

Our support team aims to respond within 12 hours to ensure your concerns are addressed promptly.

For further information or to explore other industrial automation products, please visit the [ATO Store](#).